

REMARKS

Amendments to the Claims

Claim 72 has been amended to recite the curable elastomeric nanocomposite consists essentially of the swellable clay and the functionalized elastomer; thus excluding the presence of secondary elastomers that would negatively affect or alter the characteristics of the curable elastomer (i.e., reduced impermeability of the compound).

35 U.S.C. §112, second paragraph

Numerous claims were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the claims have been rejected as having improper Markush groups due to the use of the connecting word “and” for nested Markush groups. Applicants disagree.

As stated within the rejection itself: “nested alternative groups within Markush language must also adhere to proper Markush language” – thus nested groups within a Markush are required to use the word “and.” This is what is presented in the present claims for listings such as ‘C₁ to C₂₀ alkyls, alkenyls and aryls’. The Office appears to be arguing that the above example is equivalent to “wherein R is A, B, C, or D.” It is not. A full reading of the claims, even as presented in the rejection, shows that ‘C₁ to C₂₀ alkyls, alkenyls and aryls’ follows the language of ‘selected from the group consisting of’ and thus is a nested Markush group; one skilled in the art would readily appreciate that what is being claimed as part of the Markush group is ‘C₁ to C₂₀ alkyls, C₁ to C₂₀ alkenyls, and C₁ to C₂₀ aryls’.

Furthermore, given that the Office had previously rejected the claims for the use of “or” in the claims and required Applicants to change the language to ‘and’, to now object to the amendment, is contradictory.

It is requested that this rejection be reconsidered and withdrawn.

35 U.S.C. § 103

All pending claims stand rejected under 35 U.S.C. § 103 as being obvious over Arjunan (US 5700871) in view of Elspass (US 5807629) for the reasons set forth in the January 2010 Office Action.

Arjunan discloses a functionalized isoolefin- alkylstyrene copolymer for blending with dissimilar elastomers (col 3, lines 23-40; col 4, line 40 – col 5, line 21); thereby achieving a multi-rubber blend with desired characteristics. After the preferred isobutylene/paramethyl styrene copolymer is grafted, it is added to a dissimilar elastomer and then compounded to include the conventional elastomeric/rubber additives such as fillers, plasticizers, and cure packages (col 7 – col 8, line 24).

The Office, in acknowledging that Arjunan fails to teach adding a swellable clay, holds that it would be obvious to look to the teachings of Elspass in regards to adding a layered clay to the material to create a curable nanocomposite.

In the current Office Action, it is held that Arjunan already contemplates the addition of amine compounds to the composition and thus the addition of Elspass' amine exfoliated layered clays would not have been of concern, as argued by Applicant. Supporting this argument, the Office points to col 7, line 34 and col 8, line 8. The compound at col 7, line 34 is a curing agent and that at col 8, line 8, is a blowing agent. Thus, Arjunan teaches amine compounds significantly affect the properties and characterization of the compound. With these teachings of Arjunan, one skilled in the art might expect the inclusion of an amine exfoliated compound of Elspass to result in premature curing or undesired blowing of the final compound.

The Office states that the amine exfoliation compounds of Elspass are stably reacted with the clays, and would not react with the compounds of Arjunan. Applicants disagree. When the compounds are mixed in a mixer, as taught by Arjunan, the different chemical compounds are sheared and reacted – this is seen even in the examples of Arjunan wherein grafting of the polymer is done in a Brabender mixer. Thus, one skilled in the art would expect that the exfoliating agents of Elspass will undergo some degree of separation from the clay layers and would be free to interact with the other elastomeric blend constituents. Additionally, in exfoliating the clay layers, it is conventional for commercially available layered clays to have an excess of exfoliant – thus, the clay itself already contains ‘free amines’ which would interfere with the compounds of Arjunan.

To establish *prima facie* obviousness, there 1) must be some suggestion or motivation in the art to modify or combine the references; 2) must be a reasonable expectation of success; and 3) the combined references must teach or suggest all the claim limitations. *Graham v. Deere*. The Office has not met all three requirements for *prima facie* obviousness.

For the reasons set forth in Applicants prior response and as further discussed above, Applicants respectfully assert that there is no reasonable expectation of success in the compound of Arjunan and is actually potentially contrary and destructive to the teachings of Arjunan, such that one skill in the art would not be motivated to attempt to add the clay of Elspass to the grafted I-PMS of Arjunan.

The court in KSR reiterated that a patent is composed of several elements and is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007). A reason for the combination is still an important consideration, even though it need not be a rigid formula, nor "a formalistic conception." While the Office has provided a reason to try, the courts have held numerous times that 'obvious to try' is not the standard of 35 USC 103, *in re Tomlinson*, 53 CCPA 1421, 363 F.2d 928, 150 USPQ 623 (1966), and the invention as obtained by the combination of the prior art – i.e., the perceived invention as directed by the prior art, must also be considered and whether there is the reasonable expectation of success, as required by *Graham v. Deere*.

As argued above by Applicants, due to potential chemical interactions between the grafting agent of Arjunan and the swelling agent on the clay of Elspass, which may negatively impact Arjunan's desired ability of the I-PMS to graft and blend with the dissimilar rubber, one skilled in the art would not be motivated to combine the teachings of Elspass and Arjunan, as set forth in the Office Action.

Furthermore, under the standard of "obvious to try," the Supreme Court has held there must be "a finite number of identified, predictable solutions, [that] a person of ordinary skill has good reason to pursue ..." *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1742 (2007). Herein, there are *NOT* a finite number of identified, predictable solutions and the Office has used hindsight to pick and choose among the plurality of references to reject the present invention. Arjunan is directed to improving compatibility between two different, usually incompatible, elastomers. Arjunan is not directed to increasing impermeability of the blend through the use of a very particular type of filler – one not even taught by Arjunan. The clay, disclosed as a conventional filler, is not the same as the exfoliated and layered clays of Elspass or the 'swellable' layered clay presently recited by Applicants. To arrive at the reasoning of improving the impermeability of Arjunan is to use Applicants' invention against them to arrive at the rejection.

It is respectfully requested that this rejection be reconsidered and withdrawn.

In light of this amendment, Applicants are of the position that all of the claims now pending in the subject patent application are allowable. Thus, the Examiner is respectfully requested to allow all pending claims. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

Please charge any deficiency in fees or credit any overpayments during the entire pendency of this case to Deposit Account No. 05-1712 (Docket No. 2002B093/2). Please also charge any petition fees, including fees for extensions of time necessary for the pendency of this case or copendency of this application with another application at any time to Deposit Account No. 05-1712 (Docket No. 2002B093/2).

Respectfully submitted,

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Date

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